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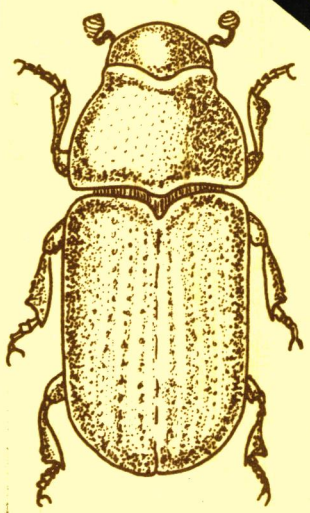
BIOLOGICAL EVALUATION
Southwestern Dwarf Mistletoe

Silver City Ranger District
Gila National Forest
New Mexico

1976



Southwestern Region

U. S. DEPARTMENT OF AGRICULTURE

FOREST SERVICE

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Southwestern Dwarf Mistletoe

Silver City Ranger District
Gila National Forest
New Mexico

January 1976

Forest Insect and Disease Management
State and Private Forestry
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INTRODUCTION

Southwestern dwarf mistletoe (Arceuthobium vaginatum subsp. cryptopodum) is the most destructive disease of ponderosa pine in the Southwest. This parasitic plant causes growth reduction, deformity, mortality, and reduced seed production in infected trees. Silvicultural control of dwarf mistletoe in timber stands is the most efficient and economical method of treating this disease. Silvicultural control frequently can be accomplished by standard thinning procedures or a combination of standard thinning and sanitation thinning.

In June 1975, the 445-acre Sheep Corral stand on the Silver City Ranger District (Fig. 1) was evaluated by personnel from the Forest Insect and Disease Management Staff Unit. The primary purpose of this survey was to evaluate the dwarf mistletoe situation in the stand. Secondly, information from the evaluation was to be used in testing the simulated yield program for even-aged dwarf mistletoe-infected ponderosa pine stands of the Southwest (Edminster and Hawksworth, 1975). Results of this testing are not included in this evaluation.

METHODS

The stand boundary was marked by Ranger District personnel as a precommercial thinning project. The area delineated for the survey was sampled by Insect and Disease Management personnel, and results contained in this evaluation apply only to the area sampled (Fig. 2). The sampling procedure used was as follows:

1. Age measurements from 20 trees representative of the management age class were obtained.

2. Site index measurements were taken on 12 dominant ponderosa pines that best represented maximum site potential for site types present in the area.

3. Sample plots were established at 4-chain intervals along compass lines located 4 chains apart; the sample point was the center of a variable-size circular plot (maximum radius of 33 feet); the plot was divided into four quadrants by the intersection of a base line at right angles to the compass line; the third nearest live ponderosa pine (blackjack and 4.5 feet tall or more) to plot center in each quadrant was sampled; distance from plot center to the third nearest tree, d.b.h., and presence or absence of dwarf mistletoe were recorded; data were processed through the DENSUR computer program, which summarizes basic data and provides average tree density, average d.b.h., and percent trees per acre infected with dwarf mistletoe.

4. Information concerning the overstory (yellow pine) was collected by sampling all overstory trees that occurred within the maximum radius on each plot; tree d.b.h. and presence or absence of dwarf mistletoe were recorded for each live ponderosa pine overstory tree occurring on the plot.

RESULTS

Figure 2 provides information pertaining to line and plot distribution, area sampled, and distribution of dwarf mistletoe within the sampled area. In Figure 2, plots with dwarf mistletoe had at least one infected sample tree (of the four quadrants sampled). Also, plots with less than two "count trees"[1/] were considered understocked and were not used in the data analysis. Deletion of these plots provided a more accurate "density estimate" of the stand to be thinned.

Data were collected on 278 plots over the 445-acre area sampled. Survey results indicated an average site index of 80 (based on Myer, 1961). The average age of understory trees was 47 years. No age measurements were taken for overstory trees. The following tabulation provides a summary of the data collected in Sheep Corral stand:

	Understory (blackjack)	Overstory (yellow pine)
Tree density (trees/acre)	772	9.6
Average d.b.h. (inches)	5.2	19.0
Dwarf mistletoe (% trees infected)	26	32

DISCUSSION AND RECOMMENDATIONS

Survey results indicate that dwarf mistletoe is well established throughout much of the Sheep Corral stand. Treatment of mistletoe-infected trees in the stand may be advantageous due to the overstocked condition, low average diameter, and relatively high mistletoe percentage. Spread of dwarf mistletoe will continue to increase and result in deterioration of the stand prior to rotation age. However, a standard silvicultural thinning of the sampled area is currently underway; therefore, additional benefits derived from a sanitation thinning cannot be assessed at this time.

1/ "count trees" - a blackjack, 4.5 feet or taller, the third nearest tree in the sample quadrant, and within 33 feet of plot center.

Results of this evaluation indicate the following management alternative should be considered:

1. Removal of dwarf mistletoe-infected overstory trees, class 3 and above (6-class mistletoe rating system), would help reduce spread of dwarf mistletoe from overstory trees to understory trees. Although the density of yellow pine appears to be quite low, if sawtimber-size blackjacks (class 3 and above) are included, the number of trees to be removed should be acceptable for a salvage timber sale.

2. Following the standard thinning and overstory removal, evaluate the dwarf mistletoe situation in residual stand. If necessary, initiate a sanitation thinning in residuals. Due to diameter and spacing restrictions incorporated in the standard thinning, it is likely that many mistletoe-infected residuals will be present in the stand. As a result of reduced density in the residual stand, the rate of mistletoe spread will increase. Thus, a follow-up sanitation thinning in the residual stand may be necessary to realize maximum benefits of dwarf mistletoe suppression.

By following the above recommendations, the dwarf mistletoe problem in Sheep Corral stand will be reduced, and an acceptable yield may be obtained from the stand. Funding for dwarf mistletoe suppression may be available from Forest Insect and Disease Management. Forest Service Manual sections 5232-4 and 5281 outline procedures for obtaining these funds. Personnel from the Forest Insect and Disease Management Staff Unit should be contacted in regard to funding requests or other information pertaining to dwarf mistletoe suppression.

LITERATURE CITED

Edminster, C. B., and F. G. Hawksworth. 1975. User's guide to SWYLD2: yield tables for even-aged and two-storied stands of southwestern ponderosa pine, including effects of dwarf mistletoe. In press.

Meyer, W. H. 1961. Yield of even-aged stands of ponderosa pine. USDA Tech. Bull. No. 630. 59 p.

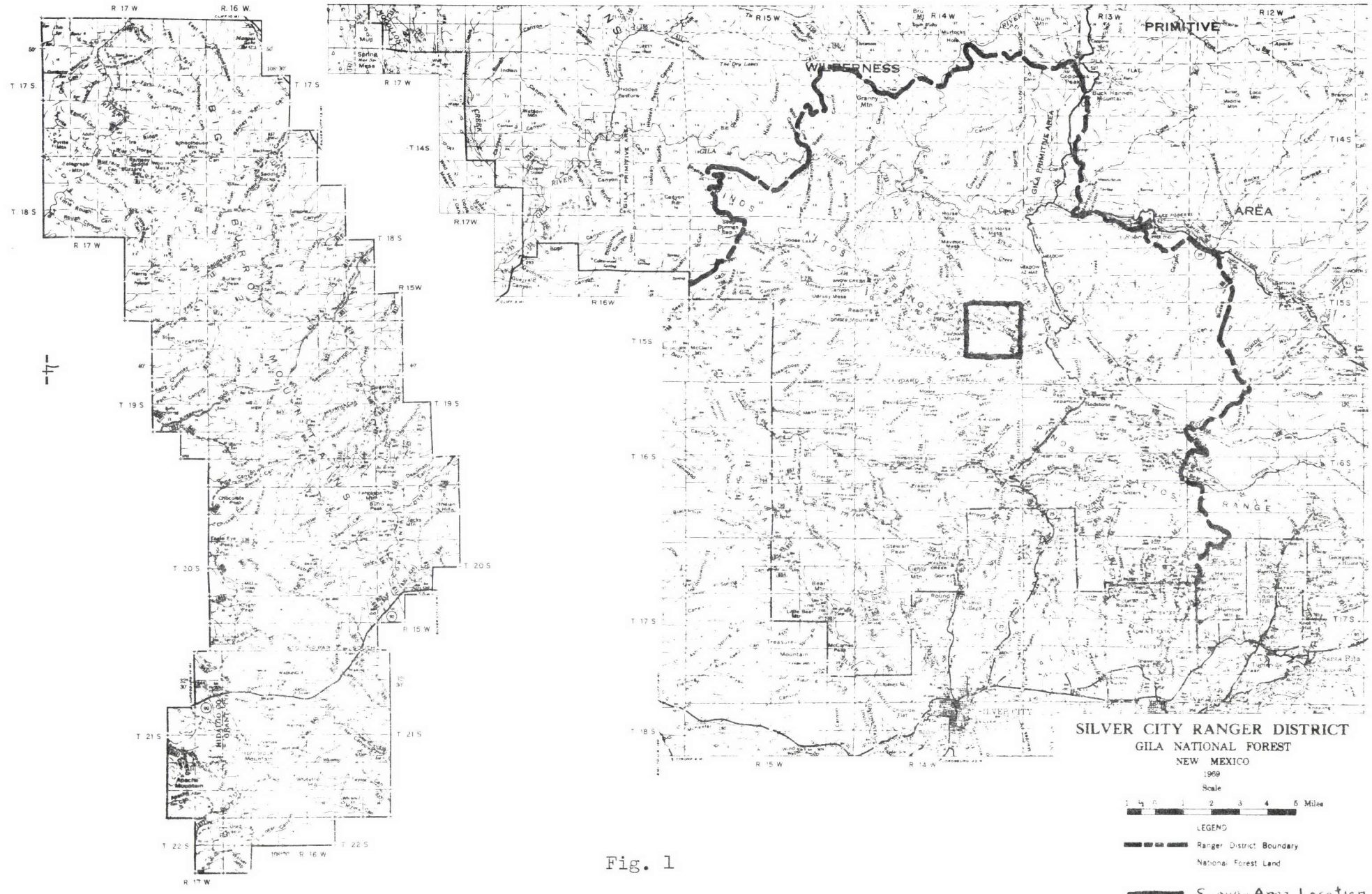
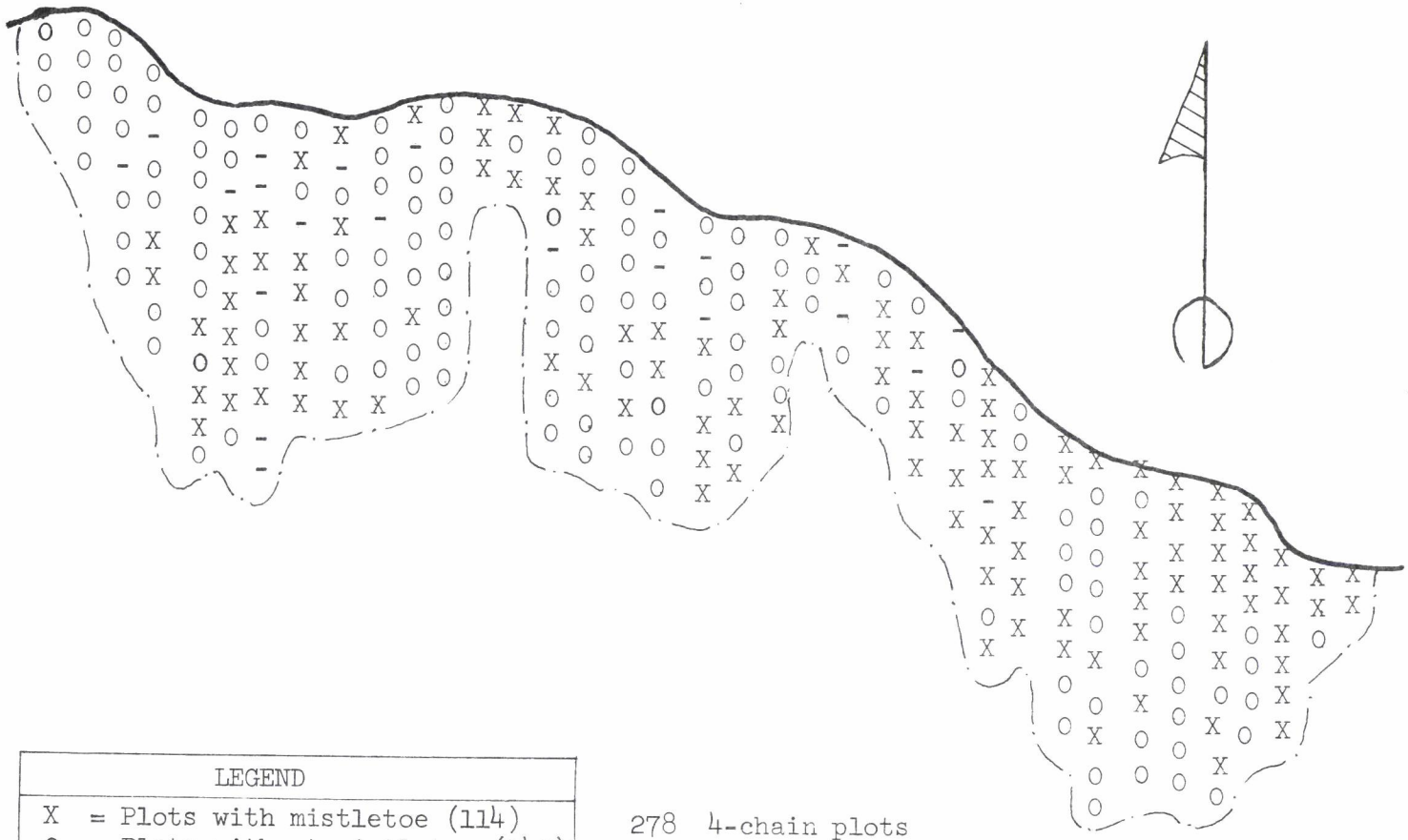

SILVER CITY RANGER DISTRICT
GILA NATIONAL FOREST
NEW MEXICO
1969
Scale
1 4 0 1 2 3 4 5 Miles
LEGEND
Ranger District Boundary
National Forest Land
Survey Area Location
PRIMITIVE
WILDERNESS
AREA
GILA PRIMITIVE AREA
R 17 W
R 16 W.
R 15W
R 14 W
R 13W
R 12W
T 17 S
T 18 S
T 19 S
T 20 S
T 21 S
T 22 S
T 14S
T 15S
T 16 S
T 17S
T 18S
R 16W
R 15 W
R 14 W
SILVER CITY

Fig. 1



LEGEND	
X	= Plots with mistletoe (114)
O	= Plots without mistletoe (142)
-	= Understocked plots (22)
-·-·-	= Survey area boundary

278 4-chain plots
Scale: 1 cm = 8 chains

Fig. 2.--Distribution of dwarf mistletoe in sampled area.